STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

ROAD PLAN

SALE NAME:
S-1000 Thinning

ROAD PLAN DATE:
3/17/06

J. Garstang

SCOPE OF PROJECT

This project includes, but is not limited to reconstruction including:

Road	Stations	Requirements
FR-S-1015	8+42	Brushing right-of-way, pulling ditches, cleaning ditches, constructing catch basin and headwall, cleaning culvert inlets and outlets, cross drain culvert installation, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, road and landing abandonment.
FR-S-1016	14+71	Brushing right-of-way, pulling ditches, cleaning ditches, cross drain culvert installation, constructing catch basin and headwall, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, removing berms from road shoulders, road and landing abandonment.
FR-S-1016.1	9+60	Brushing right-of-way, pulling ditches, cleaning ditches, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, removing berms from road shoulders, road and landing abandonment.
FR-S-1017	0+00 to 11+76	Brushing right-of-way, pulling ditches, cleaning ditches, cleaning culvert inlets and outlets, cross drain culvert installation, constructing catch basin and headwall, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, removing berms from road shoulders, road and landing abandonment. Subgrade repair at station 10+13.
FR-S-1017	11+76 to 12+26	Brushing right-of-way, pulling ditches, cleaning ditches, cleaning culvert inlets and outlets, cross drain culvert installation, constructing catch basin and headwall, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, removing berms from road shoulders, road and landing abandonment. Remove culvert and fill at station 12+01.
FR-S-1017	12+26 to 17+84	Brushing right-of-way, pulling ditches, cleaning ditches, cleaning culvert inlets and outlets, cross drain culvert installation, constructing catch basin and headwall, hauling and application of rock, grading and shaping existing road surface and turnouts, compaction of road surface, removing berms from road shoulders, road and landing abandonment.

This project also includes, but is not limited to pre-haul maintenance including:

Road	Stations	Requirements
FR-S-1018	3+11	Brushing right-of-way, pulling ditches, cleaning ditches, cleaning culvert inlets and outlets, grading and shaping existing road surface and turnouts, removing berms from road shoulders.

The project also includes 1/2 acre of stripping in Boxcar Pit.

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SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction or reconstruction or pre-haul maintenance or abandonment including landings unless otherwise noted.

1.1-2

Construction or reconstruction or pre-haul maintenance of the following road/s is required. All road/s shall be constructed or reconstructed or pre-haul maintained on the State's location and in accordance with the Road Plan.

Road	Length	Type
FR-S-1017	0+50	Reconstruction

1.1-3

Construction or reconstruction or pre-haul maintenance of the following road/s is not required. **If the Purchaser elects to use any of these roads, they shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.**

Road	Length	Type
FR-S-1015	8+42	Reconstruction
FR-S-1016	14+71	Reconstruction
FR-S-1016.1	9+60	Reconstruction
FR-S-1017	17+34	Reconstruction
FR-S-1018	3+11	Pre-haul Maintenance

1.1-4

Any departure from this Road Plan including relocation, extension, change in design or additional roads shall be submitted, in writing, to the Contract Administrator for consideration. Submitted plans must be approved before construction begins.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to, solid subsurface rock, subsurface springs or saturated ground, and unstable soil.

1.2-1

Construction and/or reconstruction shall not be permitted from November 1 to April 30 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2.1-1

Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches and culvert installation shall be completed and are subject to written approval by the Contract Administrator prior to rock application.

1.2-2

Purchaser shall not use roads constructed or reconstructed or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right of way, without written approval from the Contract Administrator.

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1.3-1

Rock hauling shall not be permitted from November 1 to April 30 unless authorized, in writing, by the Contract Administrator.

1.5-1

Maintenance on roads listed in contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with the Forest Access Road Maintenance Specifications.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 6 inches dbh or over 20 feet high between the marked right-of-way boundaries and within waste areas or if not marked in the field, between clearing limits specified on Typical Section Sheet.

2.1-3

Right-of-way timber shall not be decked within the grubbing limits or in locations that interfere with the construction of the road prism, as defined by the Contract Administrator. Right-of-way timber shall not be decked in locations that impede drainage.

2.1.4 The following roads shall be brushed by hand, mechanical brusher, or other method approved by the contract administrator according to the Brushing Detail. All vegetative material greater than one inch in diameter that is within 4 feet of the edges of the road shoulder and/or center of the ditchline. Cut material shall not be left on or in cut slopes, ditchlines, or running surfaces.

Road	Stations
FR-S-1015	8+42
FR-S-1016	14+71
FR-S-1016.1	9+60
FR-S-1017	17+84
FR-S-1018	3+11

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the Typical Section Sheet. Those with undercut roots shall be removed.

3-2

Grubbing limits are defined as the entire area between external limits shown on the Typical Section Sheet.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all vegetative material larger than one cubic foot in volume, within the clearing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to application of rock.

4.2.3-3

Right-of-way debris shall not be placed against standing timber.

4.2.3-4

Right of way debris shall be scattered outside the grubbing limits.

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SECTION 5 - EXCAVATION

5.1-1

Unless controlled by construction stakes or specific design sheets herein, roads shall be constructed in accordance with dimensions shown on the Typical Section Sheet.

5.1-4

Extra widening on the inside of curves shall be:

2 feet extra --- 80 to 100 foot radius curves
4 feet extra --- 60 to 80 foot radius curves

5.1-5

Curve widening where required, shall be added to the inside of curves.

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table (except as construction staked or designed):

Material Type	Excavation Slope Ratio
Common Earth (on side slopes to 55%)	1:1
Common Earth (55% to 70% sideslopes)	3/4:1
Common Earth (on slopes over 70%)	1/2:1
Fractured or loose rock	1/2:1
Hardpan or solid rock	1/4:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Shoulder	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment slope ratio
Common earth and rounded gravel	1-1/2:1
Angular rock	1-1/4:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from embankment shown on Typical Section Sheet and from waste material deposited on slopes in excess of 40 percent.

5.1-15

Except as listed in clause 5.1-16 (endhaul/overhaul), excavated material may be deposited adjacent to the road prism on side slopes up to 45 percent if the material is compacted and more than 50 feet away from live streams.

5.1-21

Waste material shall not be deposited within 50 feet of a live stream, riparian management zone, wetland, or wetland management zone.

5.3-6

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On the following road within 50 feet of the stations listed below, Purchaser shall excavate as directed by the Contract Administrator, to a depth not to exceed 25 feet, and remove organic debris and other unsuitable material from the excavation. Unsuitable material shall be end-hauled to a waste area.

Road	Stations	Remarks
FR-S-1017	10+13	Subgrade repair as directed by Contract Administrator

5.4-1

Silt-bearing runoff, as defined by the Contract Administrator, shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds or other methods to be approved, in writing, by the Contract Administrator.

5.5-5

Finished subgrade shall be crowned as shown on the Typical Section Sheet. Grade and compact to a uniform, firm, rut-free surface to ensure surface runoff in an even unconcentrated manner.

5.6-2

Seed, fertilizer, and mulch mixes will meet the specifications shown below:

SEED

Grass seed, of the following composition, proportion, and quality shall be applied at the rate of -- 80 -- pounds per acre.

Kind and Variety of Seed in Mixture	% By Weight	Minimum % Pure Seed	Minimum % Germination
Perennial Rye	40	39.2	90
Red Fescue	35	34.3	90
Highland Bent	10	9.8	85
White Clover	15	14.7	90
Weed Seed		.5 max.	
Inert and Other Crop		1.5 max.	
		100.0	

FERTILIZER

Fertilizer shall be applied to supply the following amounts of nutrients:

Total Nitrogen as N -- 135 -- pounds per acre.

Available Phosphoric Acid as P205 -- 60 -- pounds per acre.

Soluble Potash as K20 -- 60 -- pounds per acre.

MULCH

Straw, Wood cellulose fiber or other mulches as approved in writing by the Contract Administrator shall be applied at a rate of -- 1800 -- pounds per acre.

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SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install and maintain corrugated polyethylene and/or aluminized steel Type 2 (ASTM A929, A760, A796, AASHTO M274, M36) pipe as designated on Culvert List. Culvert and flume lengths shall be varied to fit as built conditions subject to written approval by the Contract Administrator.

6.2.1-1A

Corrugated polyethylene pipe shall have a corrugated exterior and smooth interior, shall meet ASTM F405,F667 and AASHTO M252,M294 Standard Specifications, and shall be manufactured with high density polyethylene resins.

6.2.1-2

Manufacturer's approved connectors shall be used for corrugated polyethylene pipe. Annular corrugated bands and culverts ends shall be used on aluminized steel pipe.

6.2.1-6

Metal, concrete or plastic culverts removed from the road bed shall be removed from State land prior to the termination of this contract.

6.2.2.1-1

Culvert, downspout, flume and energy dissipator installation shall be in accordance with Culvert and Drainage Specification Detail.

6.2.2.2-1

Any damaged aluminized coating or cut ends shall be retreated with a minimum of 2 coats of zinc rich paint.

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3 percent nor more than 10 percent.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed prior to application of rock. Ditches shall drain to culverts, ditchouts and natural drainages.

6.3-2

Shaping the ditchline, culvert headwalls and catchbasins shall be completed prior to application of rock and shall be done in accordance with the Typical Section Sheet and Drainage Specification Detail.

6.4-1

Catch basins shall be constructed to resist erosion. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Head walls shall be constructed in accordance with Culvert and Drainage Specification Detail at all cross-drain culverts.

6.5-2

Embankment slopes adjacent to culvert inlets and outlets shall be armored for a distance of two culvert diameters on each side of the pipe and one culvert diameter above the pipe in accordance with Culvert List.

SECTION 7 - ROCK

7.1-1

Rock used under this contract may be obtained from the following pits on State land:

Source # / Name	Location	Rock Type
Boxcar Pit	S32, T30N, R12W	Pit run

7.1-5

Use of all other rock sources are subject to written approval from the Contract Administrator.

7.2-1

All pit operations shall be done according to State plans as listed below:

Pit
Boxcar Pit Plan, dated July 15, 2005

7.2.1-1

Rock shall meet the following specifications for gradation when placed on the subgrade. No more than 10% of the rock shall be larger than 8 inches in any dimension and no rock shall be larger that 12 inches in any dimension.

7.3-1

The following pit work is required. Work is to be done according to the approved "pit plan" and as directed by the Contract Administrator.

Name	Requirements
Boxcar Pit	Strip 1/2 acre.

7.4.2-1

Apply at least the minimum required rock quantity as shown on the Rock List.

7.4.2-2

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-7

Turnouts and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8

Each lift of rock shall be shaped as shown on the Rock List and shall be uniform, firm, rut-free and shaped to ensure surface runoff in an even unconcentrated manner.

SECTION 9 - ROAD AND LANDING CLOSURES

9.1-1

The following road/s shall be closed by the purchaser within 10 days following completion of timber harvest.

FR-S-1015, FR-S-1016, FR-S-1016.1 and FR-S-1017.

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9.1-2

On the following roads abandonment shall consist of:

Constructing non-drivable waterbars in conformance with the attached Non-Drivable Water Bar Detail at a maximum spacing that will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 400 feet, skewing waterbars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade, and keying waterbars into ditchline.

Construction of tank trap barriers in accordance with the attached Tank Trap Detail.

Removing the culvert and fill at station 12+00 on the FR-S-1017 road. This shall not be permitted between September 16 and June 30 unless permission is granted in writing by the contract administrator.

Removing ditch cross drain culverts and leaving the resulting trench open.

Culverts shall be removed from State lands by Purchaser.

Grass seed and mulch locations where culverts are removed. Seed and mulch shall be provided by the Purchaser and shall be applied at the earliest possible opportunity between July 1 and September 15 and shall meet the specifications in Road Plan clause 5.6-2.

Road	Station
FR-S-1015	8+42
FR-S-1016	14+71
FR-S-1016.1	9+60
FR-S-1017	17+84

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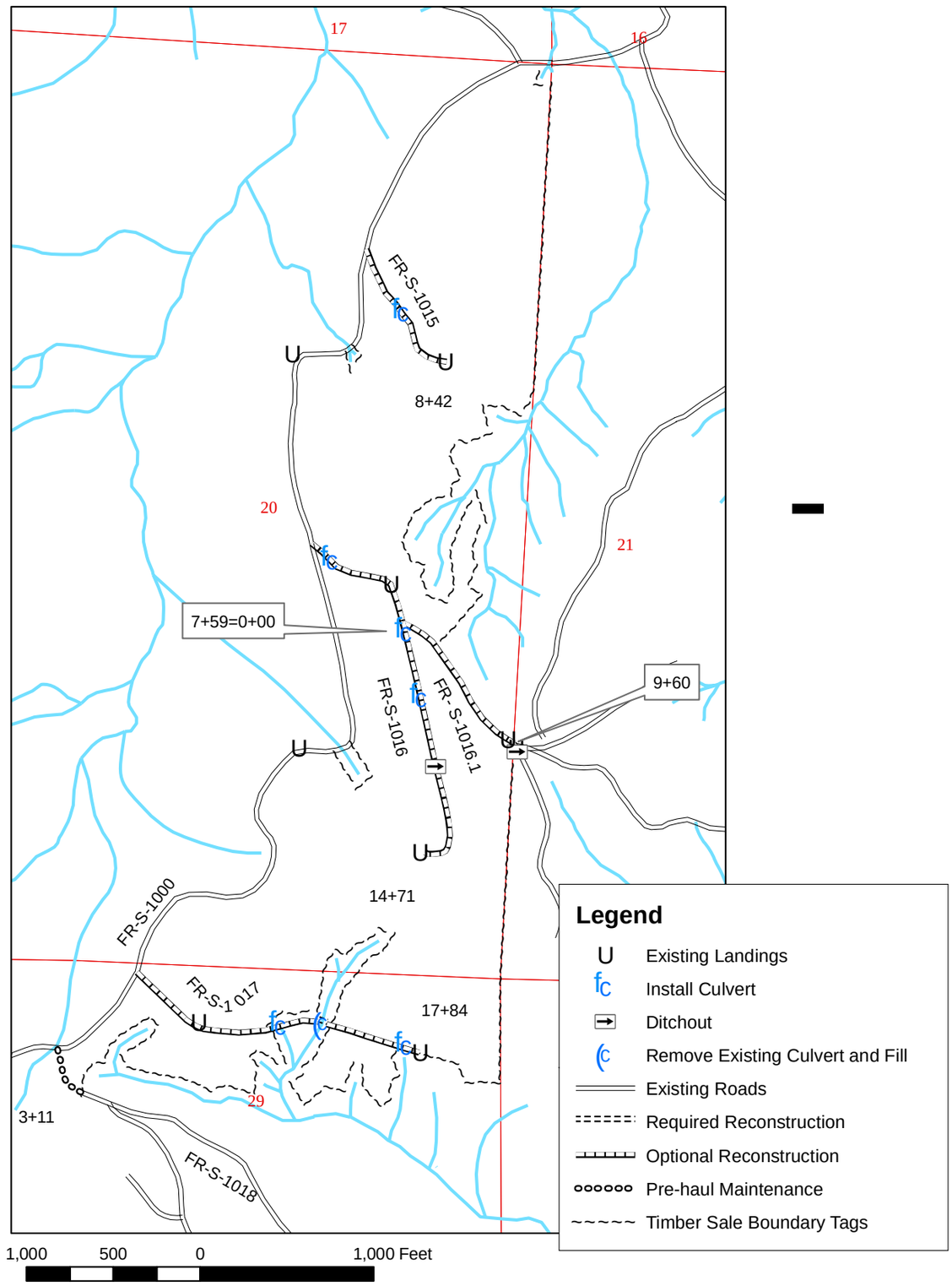
PROJECT MAP



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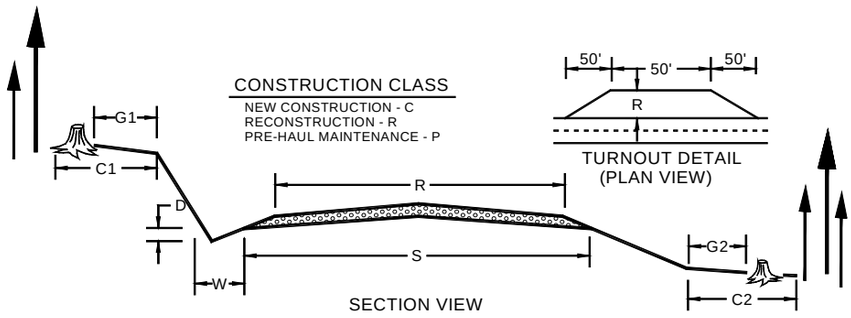
TYPICAL SECTION SHEET



ROAD NAME	START STATION	END STATION	CONSTRUCTION CLASS		SUBGRADE WIDTH (S)	ROAD WIDTH (R)	CROWN " AT CL	DITCH WIDTH (W)	DITCH DEPTH (D)	GRUBBING CUT BANK (G1)	GRUBBING FILL TOE (G2)	ROAD CUT CLEARING (C1)	ROAD FILL CLEARING (C2)	
FR-S-1015	0+00	8+42	R		13	10	4	3	1					
FR-S-1016	0+00	14+71	R		13	10	4	3	1					
FR-S-1016.1	0+00	9+60	R		13	10	4	3	1					
FR-S-1017	0+00	17+84	R		13	10	4	3	1					
FR-S-1018	0+00	3+11	P			10	4	3	1					

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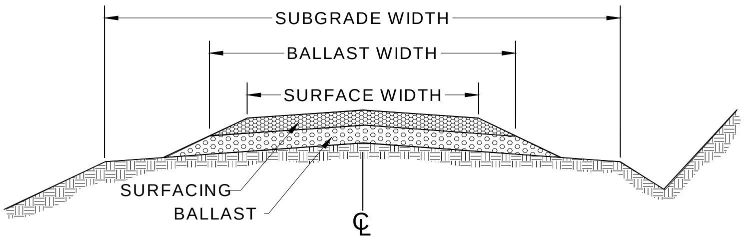
ROCK LIST



SECTION VIEW

1. **Rock quantities, subtotals and totals are "truck measure" estimates. Rock shall be applied to at least the depths listed. All depths are compacted depths.**
2. **Rock slopes shall be 1½ (H) : 1 (V).**
3. **All rock sources are subject to approval by the Contract Administrator.**
4. **Rock source A= Boxcar Pit**
   Rock source B=

ROAD NAME	START STATION	END STATION	SUBGRADE WIDTH (ft)	BALLAST SOURCE	BALLAST WIDTH (ft)	BALLAST DEPTH (in)	BALLAST QUANTITY (cu.yd./sta	BALLAST SUBTOTAL (cu.yd)	SURFACE SOURCE	SURFACE WIDTH (ft)	SURFACE DEPTH (in)	SURFACE QUANTITY (cu.yd./sta	SURFACE SUBTOTAL (cu.yd)
FR-S-1015	0+00	8+42	13	A	10	12	60	505					
FR-S-1016	0+00	14+71	13	A	10	12	60	883					
FR-S-1016.1	0+00	9+60	13	A	10	12	60	576					
FR-S-1017	0+00	17+84	13	A	10	12	60	1070					
FR-S-1017	10+10	10+15		A				4					

BALLAST TOTAL = 3038 **SURFACE TOTAL** = 0

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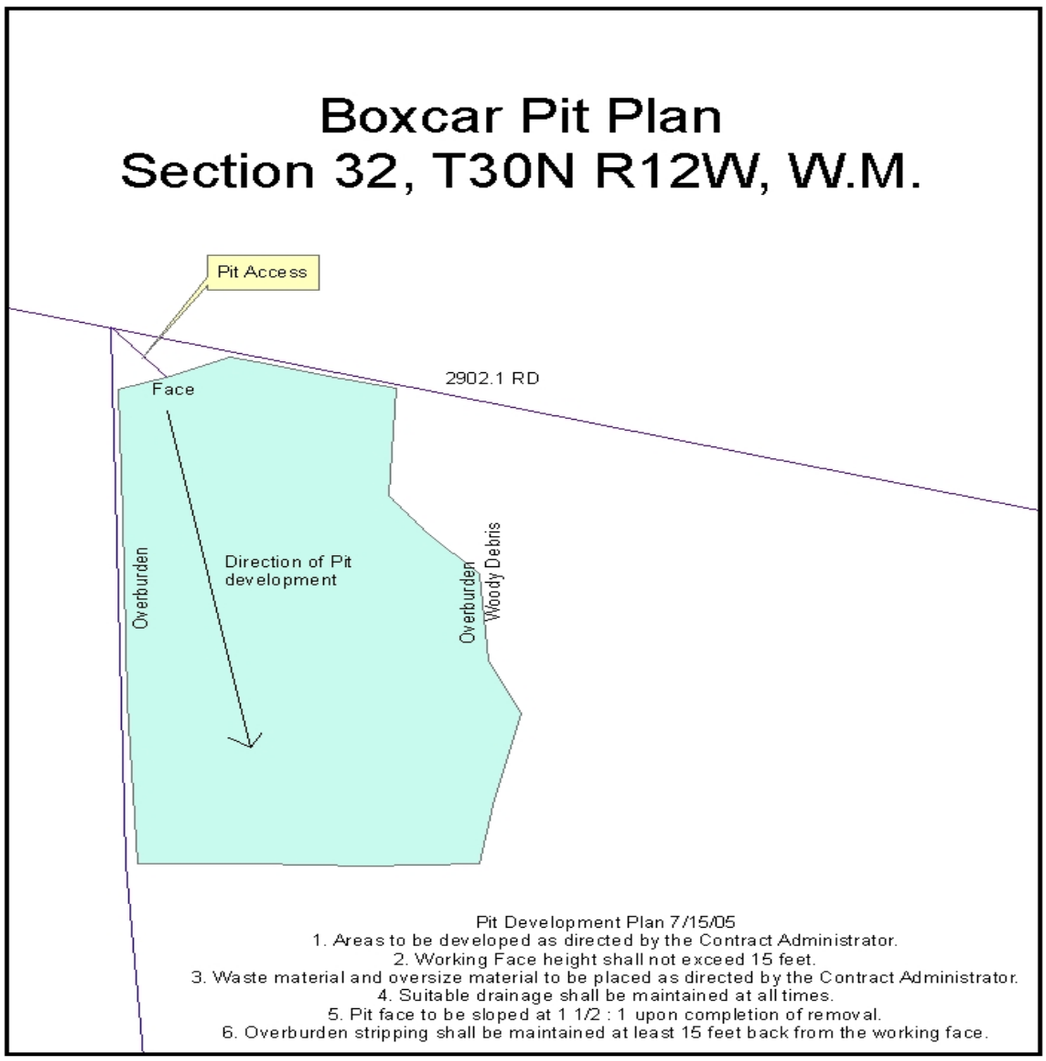
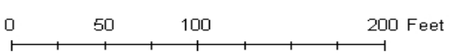
PIT PLAN





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CULVERT LIST

ROAD NAME	STATION	CULVERT DIAMETER (in)	CULVERT LENGTH (ft)	FLUME LENGTH (ft)	DOWNSPOUT LENGTH (ft)	RIP RAP- INLET (cy)	RIP RAP - OUTLET (cy)	BACKFILL MATERIAL	NOTES
FR-S-1015	2+64	18	24						
FR-S-1016	1+50	18	28						
FR-S-1016	7+65	18	28						
FR-S-1016	11+99	18	28						
FR-S-1017	10+13	18	24						Repair subgrade
FR-S-1017	17+17	18	24						

All rip rap shall be 8” – 12” quarry spalls unless specified otherwise.
All backfill shall be native material unless specified otherwise.

Required Minimum Gauge for Metal Pipe

Diameter	Gauge
18”	16
24” - 42”	14
48” - 54”	12
60” - 96”	10

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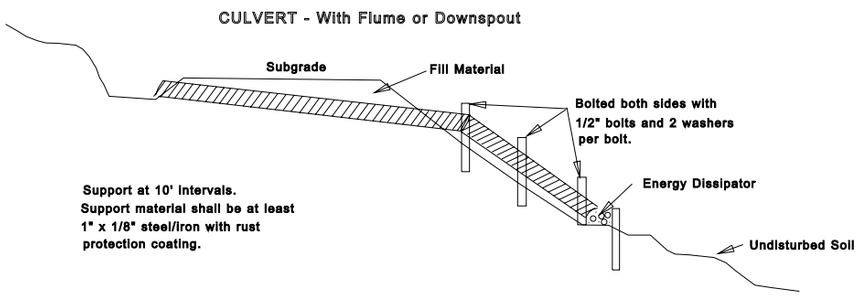
CULVERT AND DRAINAGE SPECIFICATION DETAIL

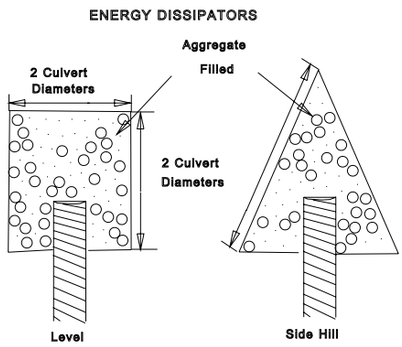
INSTALLATION REQUIREMENTS:

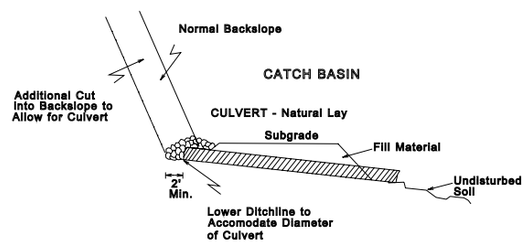
1. Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.

2. All bedding material of poor or non-uniform bearing capacity shall be removed and replaced with suitable fill. Crushed stone, gravel or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4", whichever is smaller. All material shall be compacted in six inch layers under the haunches, around the sides and above the pipe to the minimum height of cover.

3. Crushed stone and gravel backfill materials shall be compacted to a level of 90-95% AASHTO standard density. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.







DISSIPATOR SPECIFICATIONS:
Depth: 1 culvert diameter
Aggregate: 6" plus

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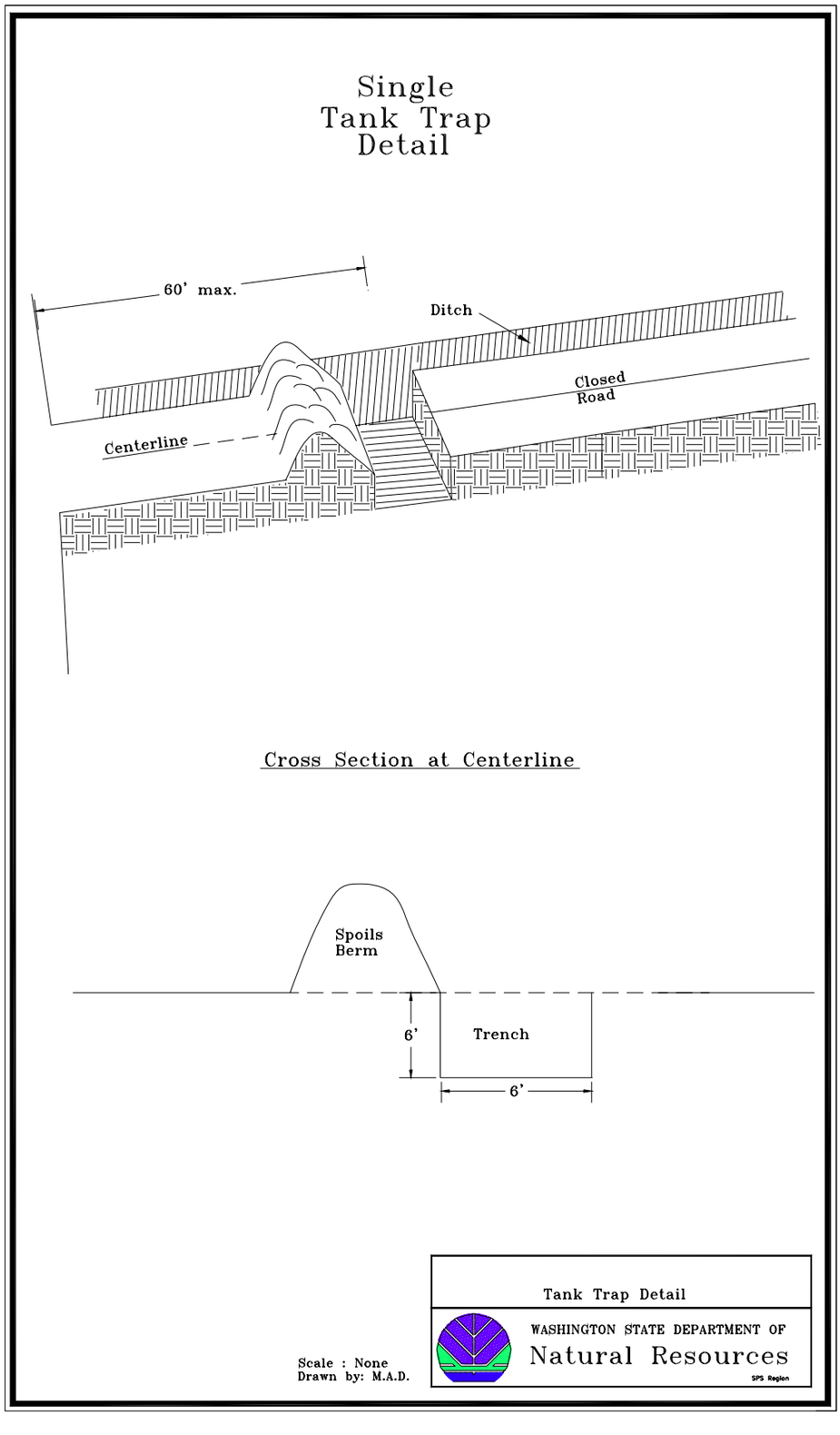
TANK TRAP DETAIL



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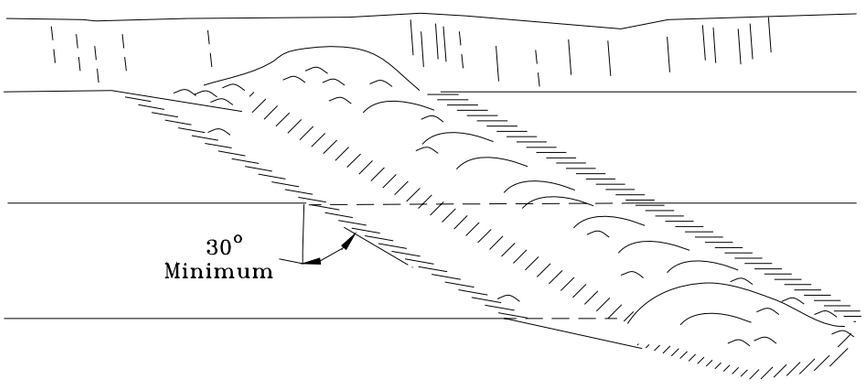
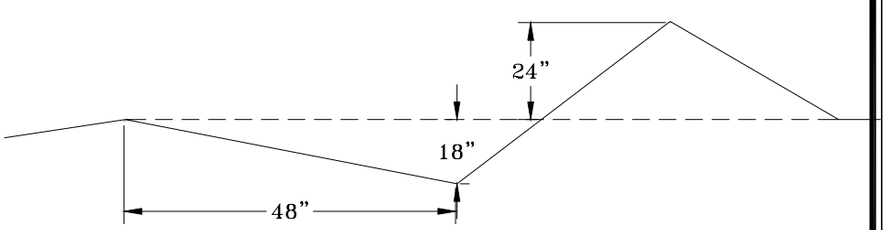
Non-Drivable Water Bar Detail

Cross Ditch



Cross Section at Centerline



Water Bar Detail

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Scale : None
Drawn by: M.A.D.

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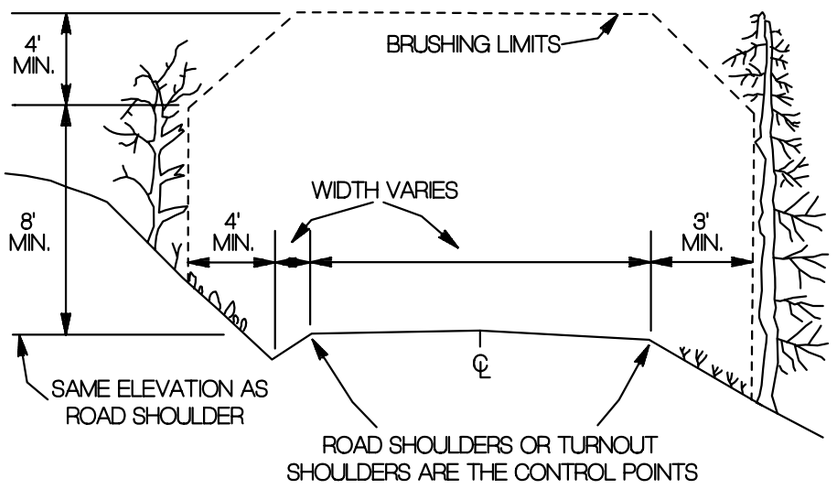
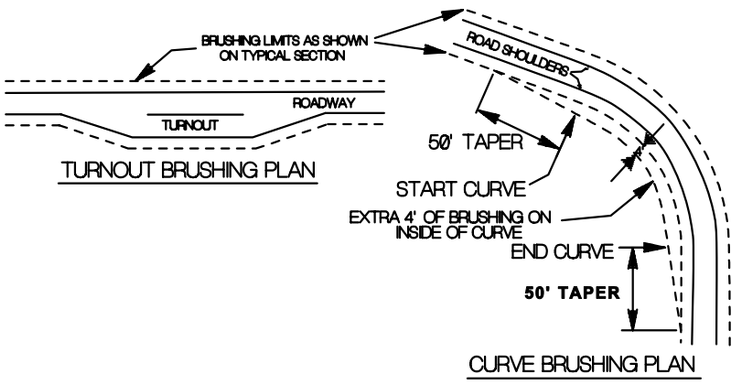
BRUSHING DETAIL



TYPICAL BRUSHING LIMITS SECTION



1.) ALL VEGETATION WITHIN THE BRUSHING LIMITS SHALL BE CUT TO WITHIN 8" OF THE GROUND, UNLESS OTHERWISE DIRECTED BY THE CONTRACT ADMINISTRATOR.
2.) ALL BRUSH, TREES, LIMBS, ETC. SHALL BE REMOVED FROM THE ROAD SURFACE.
3.) ALL BRUSH, TREES, LIMBS, ETC. THAT MAY RESTRICT THE FLOW OF WATER SHALL BE REMOVED FROM THE DITCH LINE.
4.) ALL DEBRIS THAT MAY ROLL OR MIGRATE INTO THE DITCHLINE SHALL BE REMOVED.

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STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

   A. Cuts and Fills
      1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½ : 1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
      2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
      3. Undesirable slide materials and debris shall not be mixed into the surface material.

   B. Surface
      1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
      2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
      3. Watering may be required to control dust and to retain fine surface rock.
      4. Desirable surface material shall not be bladed off the roadway.
      5. Replace surface material lost or worn away.
      6. Remove berms except as directed by the State.
      7. Barrel spread soft spots to prevent degradation of geotextile.

   C. Drainage
      1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
      2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
      3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
      4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
      5. Keep silt bearing surface runoff from getting into live streams.

   D. Structures
      Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

   E. Termination of Use or End of Season
      Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

   F. Debris
      Remove fallen timber, limbs, and stumps from the slopes or roadway.

2. Existing Roads – Timber Sale, Operator Maintained
   A. Same as above but not to exceed the condition of the road on the date the contract was signed.

3. A.R.R.F. – Directed maintenance to comply with these specifications.

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ROAD PLAN

SALE NAME:
S-1000 Thinning

ROAD PLAN DATE:
3/17/06